



14th Annual OSC Readiness Training Program

Suppression

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Version
OSC 2011

Suppression Overview

- Resources Available
- Methods to Extinguish
- Environmental Suppression
- Health and Safety
- Heavy Equipment Operations



What Type of Fire Services is Available

- Paid
- Combo
- Volunteer
- Contract



Suppression Tactics



Suppression Tactics

Based on your Pre-Fire Plan

1. Cover
2. Excavate and Foam
3. Overhaul
4. Inject inert gas (i.e., CO₂) or water
5. Flood (AKA Surround and Drown)
6. Let-it-burn
7. Accelerate (Yes It has been done!)

Apply SOIL
That's it?



**Most of the
time**

One Question for Suppression

Do you have a dedicated soil stockpile?



SF Landfill - Excavate



Best Approach

- Works well on subsurface fires from 1 to 30 feet
- Use hand held infrared to delineate fire material
- Use on localized problems
- Use foam with water
- Excavate material to a suppression deck
- Add additional cover 3x the surface area
- Can excavate down to 70 feet, limited

Overhaul

- Costly and Timely
- Must account for suppression water
- Need sq ft for a suppression deck
- High probability of success for a large scale incident

Overhaul – Fresno Debris



Source: Todd Thalhamer

Inert Gas Injection

- Limited Results – Use on small zones
- CO₂ vs. N₂ – Recommend CO₂
- Recommend for
 - Combination of specified cover and injection
 - Pre-excavation
 - 1 to 3 GCS Wells



Inert Gas Injection

- Note of caution
 - Causes frost upheaval
 - Extreme Temps
 - Use Qualified Contractors



Water Injection

- Limited Results – Use on small zones
- Best for facilities with liners and LCS

Weight of
Water?

Typical FF

Say 50,000 gal



Flooding

- In general, not recommended
- Possible stability & Leachate issues
- If used, the area should be flat and have a liner and LCS or have other mitigating circumstances

[Note: 7,000 gallons a load]



Let it Burn

- Typically selected when there is a lack of funding for suppression
- Long term air quality issues
- Stability and security issues
- Least favorable by the community



Top 3 Issues

1. Water Supply and Equipment
2. Command and Communications
3. Health and Safety



Water and Equipment



Fire Suppression Water

- Need to implement H2O Mgmt Plan
- Contaminated Water Operations

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Use of Water at a LF Fire

- Pre-cool and particulate mgmt
- Knock down and equipment safety
- Surround and Drown – Not preferred
 - Last resort
- Will increase bio decomposition
- May overwhelm the LCS



Special Equipment



Ground Monitors



Ground Monitors



Operational H&S

Your Health and Safety Plan

- Should account for all the potential exposures and site hazards
- Communications
- Hospital Locations
- Emergency Numbers
- Air Sampling Procedures
- Respiratory Issues
- Work Zone (Cold, Warm, Hot)

Respiratory Equipment



Warm Zone Firefight with Real-Time Air Monitoring



Real Time Air Data

- Photo Ionization Detector (PID)
- Particulate
- VOC, CO, H₂S, CH₄, other gasses



Respirator

- Air-Purifying Respirators
- Will Protect from particulates, dioxins, acid gasses with limits, metals
- Will not protect from CO, H₂S or Low O₂



Respirator



Source: Tony Sperling
www.landfillfire.com

Supplied Air Ground



Supplied Air Equipment



Use of Personal Gas Monitor

- Technique developed in the field to reduce exposures to hazardous gasses/chemical from waste fires
- Uses CO as a indicator of other byproducts of combustion
- Allows work to be conducted in the warm zone without respirators, SCBAs or supplied air



Personal Gas Meters

- Gasses to monitor based on site conditions
- The meter shall be intrinsically safe
- Look for water resistant models;
- Should clip or attach at breathing zone;
- Verify regulatory alert/alarm levels (e.g., STEL)
- Decide on disposable vs. calibrate type





CO
Monitors

Equipment Safety



Heavy Equipment Operations

- PPE
- Communications
- Blind Zones
- Kill Zones
- Escape Routes
- Supplied Air
- Min. of 2 piece of Heavy Iron



PPE at a Waste Fire

- Everyone in the hot and warm zone should be out fitted with the appropriate fire ground personal protective equipment (Bunker/Nomex®)
- This includes operators of equipment

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Equipment Operators



Equipment Operators



Heavy Equipment

- Communications with FF
- Post a look out at a distance

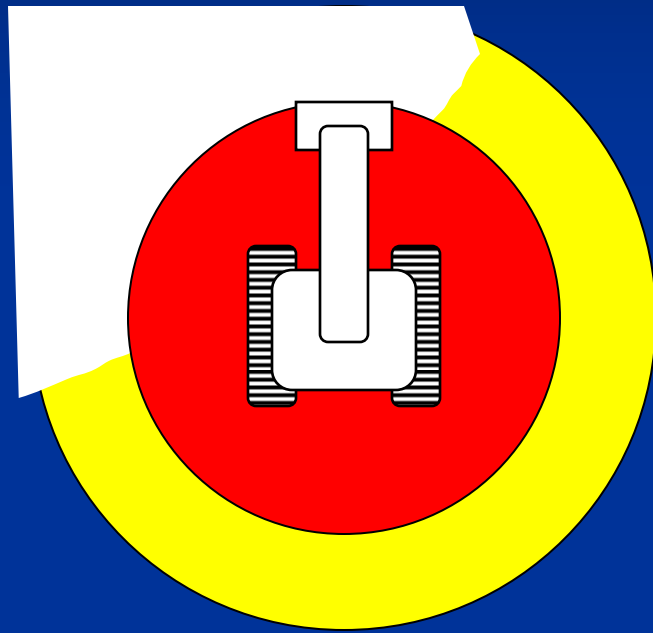
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Heavy Equipment Issue

Visibility



Equipment Zone and Rescue



Blind and **Kill** Zones



How do you perform a
rescue from an
excavator?



Clothing and Rescue

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For Example

Tracy Suppression –Supplied Air

- \$411,000/5 days
- No contaminated water was generated
- 770,000 gal of water / 990 gal of foam
- \$18 Million (US) to Remove



Supplied Air and Escape Packs



Indirect Method with Escape Routes

Favorite Method



Zone Selection



Equipment Safety

- Minimum of two pieces of equipment
 - Rescue potential, you NEED at least two
- Preferred enclosed cabs
 - Pro: Operators are more protected
 - Con: Operators are more aggressive



Bottom Line Landfill Fire Safety



Wear appropriate respiratory protection as directed by an industrial hygienist



Breathing air via a SCBA or supplied air should be used if you are in an area of smoke and/or H_2S , CO




Wear fire ground PPE



Exposure to visible smoke **SHOULD BE AVOIDED** without respiratory protection

- Portable CO monitors can be used to delineate the hot zone from warm

LF Suppression Summary

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- Pre Plan / Health and Safety Plan
 - Use available resources
 - Manage your water
 - Monitor personnel and work zones ► AVOID SMOKE
 - Have a stock pile of soil available at all times for WMU